



Beach FX

Status:

In Progress

IWR Contact:

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Purpose:

USACE approaches to estimation of storm damages and shore protection benefits have typically relied on a frequency-based evaluation framework that is analogous to that used in riverine flood damage analysis. Generally, this framework divides the causes of property loss into two classes: storm effects and long-term shoreline recession. Storm effects are represented by an erosion frequency relationship and in some cases wave and flooding damage. Erosion effects are based on historical shoreline records, and are handled separately. This leads to a set of conflicting assumptions and simplifications, for example that all storms impact the same beach cross-shore profile, or that the historical erosion rate can be treated deterministically and independently from storms sequences.

Objective:

Develop and deploy a Monte Carlo-based, event-driven coastal storm damage assessment model that facilitates the planning and evaluation of coastal protection projects within a GIS framework.

Benefits:

Beach-fx will allow study teams to move away from the frequency-based, deterministic evaluation approach and towards an event-driven approach. The event approach uses a database of plausible storms in a Monte Carlo based model to evaluate storm driven changes to the shoreline and impacts on upland development. The model will evaluate shoreline changes and economic consequences, categorized by three damage drivers: inundation, wave-attack, and erosion. Individual damage drivers will be tracked in the model on an asset-by-asset, reach-by-reach, event-by-event basis to allow for evaluation of alternatives on an emergency (unplanned) or planned basis. The models GIS framework will allow for graphical representations of shoreline changes and resulting damages, facilitating the evaluation as well as the communication of findings.

Progress:

A beta version of the model has been released and is being applied by the Mobile District in an ongoing feasibility study at Walton Beach, Florida, by the Alaska District in a feasibility study at Barrow, Alaska, and by the Shore Protection Assessment team in a study of project performance at Martin County, Florida. The model development team is developing model documentation in preparation for wider release.

Products:

Related Links:

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